

Analysis Methodology:

Establish Baseline and Electrified Building Energy Use:

- Use building energy use models from Grid Ready research for:
 - A building typology's current breakdown of fuel use between heat and hot water end uses.
 - A building typology's EUIs for heat and hot water after it electrifies.
 - We are not considering any efficiency work alongside electrification

- Find the average WN fuel and electric EUIs for each building sector using the 2022 LL84 data
 - Specifically, we used three different WN fuel and electric EUIs for each sector:
 - "Average Building Performance": The mean WN fuel and electric EUIs for LL84 buildings between the 25th and 75th percentile of WN site EUI
 - "Inefficient Building Performance": The mean WN fuel and electric EUIs for LL84 buildings between the 76th and 90th percentile of WN site EUI
 - "Worst Building Performance": The mean WN fuel and electric EUIs for LL84 buildings between the 91st and 99th percentile of WN site EUI

- Establish the LL97 GHG baseline and effects of incremental electrification of heat and hot water systems:
 - Use the modeled end use breakdown (Grid Ready) and observed fuel EUI (LL84) to calculate a building's current LL97 GHG from fossil fuel systems
 - We then added the building's LL97 GHG emissions from electric systems by using the building's observed electric EUI
 - In increments of 2.5 percent, electrify a building's current fossil fuel use for heat and hot water, and calculate the subsequent decrease in LL97 GHG.
 - For example, at 10 percent electrification:
 - 90 percent of a building's energy used for heat and hot water is assumed to be from its current fossil fuel systems
 - 10 percent of a building's energy used for heat and hot water is assumed to be from new heat pumps
 - We did not distinguish between heat and hot water electrification.
 - A building's other energy end uses are unchanged from the baseline, and these are all assumed to be electric
 - Calculate the GHG value for each increment of electrification. There are two GHG values for each increment:

- The GHG value of the energy efficiency gains from switching a building's energy use for heat and hot water from fossil fuel to heat pumps
- The GHG value of a building's BE Credit, which is a function of the amount of kWh used by the new heat pumps